

is larger than a radius of curvature of the depletion region about the field shaping region that would be formed if said region of second conductivity type were not present.

31. A semiconductor device structure for increasing a breakdown voltage of a junction between a substrate of first conductivity type and a device region, comprising:

- a region of second conductivity type in said substrate completely buried in said substrate at a depth below and separated from said device region; and
- a field shaping region of second conductivity type spaced from said device region and spaced from said region of second conductivity, said region of second conductivity having a center located vertically beneath said field shaping region.

32. The semiconductor device structure of claim **31** wherein said region of second conductivity type is located at a distance away from said device region sufficient to permit a depletion region to form between said region of second conductivity type and said device region, when a first voltage is applied between said device region and said substrate.

33. The semiconductor device structure of claim **32** wherein said distance that said region of second conductivity type is located away from said device region is sufficient to produce a radius of curvature of the depletion region, when a second voltage that is larger than said first voltage is applied between said device region and said substrate, that is larger than a radius of curvature of the depletion region about the device region that would be formed if said region of second conductivity type were not present.

34. The semiconductor device structure of claim **31** wherein said semiconductor device is a portion of an integrated circuit.

35. The semiconductor device structure of claim **31** wherein said semiconductor device is a discrete device.

36. The semiconductor device of claim **31** wherein said region of second conductivity has a lower doping concentration than said device region.

37. The semiconductor device structure of claim **31** wherein said region of second conductivity type is located at a distance away from said field shaping region sufficient to permit a depletion region to form between said region of second conductivity type and said field shaping region, when a first voltage is applied between said device region and said substrate.

38. The semiconductor device structure of claim **37** wherein said distance that said region of second conductivity type is located away from said field shaping region is sufficient to produce a radius of curvature of the depletion region, when a second voltage that is larger than said first voltage is applied between said device region and said substrate, that is larger than a radius of curvature of the depletion region about the field shaping region that would be formed if said region of second conductivity type were not present.

39. A method for increasing a breakdown voltage of a semiconductor device, comprising:

- providing a substrate of first conductivity type having a device region of second conductivity type therein;
- forming a region of second conductivity type in said substrate completely buried in said substrate at a depth below and separated from said device region; and
- forming a field shaping region of second conductivity type spaced from said device region and spaced from said region of second conductivity, said region of second conductivity having a center located vertically beneath said field shaping region.

40. The method of claim **39** wherein said step forming a region of second conductivity type comprises locating said region of second conductivity type at a distance away from said device region sufficient to permit a depletion region to form between said region of second conductivity type and said device region, when a first voltage is applied between said device region and said substrate.

41. The method of claim **40** wherein step of locating said region of second conductivity type comprises locating said region of second conductivity type a distance away from said device region sufficient to produce a radius of curvature of the depletion region, when a second voltage that is larger than said first voltage is applied between said device region and said substrate, that is larger than a radius of curvature of the depletion region about the device region that would be formed if said region of second conductivity type were not present.

42. The method of claim **39** further comprising providing said region of second conductivity with a lower doping concentration than said device region.

43. The method of claim **39** further comprising locating said region of second conductivity type at a distance away from said field shaping region sufficient to permit a depletion region to form between said region of second conductivity type and said field shaping region, when a first voltage is applied between said device region and said substrate.

44. The method of claim **43** wherein said step of locating said region of second conductivity type further comprises locating said field shaping region from said field shaping region a distance sufficient to produce a radius of curvature of the depletion region, when a second voltage that is larger than said first voltage is applied between said device region and said substrate, that is larger than a radius of curvature of the depletion region about the field shaping region that would be formed if said region of second conductivity type were not present.

45. The semiconductor device in accordance with claim **1** wherein said outermost doped region comprises said device region.

46. The semiconductor device in accordance with claim **1** wherein said outermost doped region comprises a field shaping region spaced from said device region and spaced from said region of second conductivity.

47. The semiconductor device in accordance with claim **1** wherein said region of second conductivity type has a lower doping concentration than said device region.

48. The semiconductor device structure in accordance with claim **9** wherein said outermost doped region comprises said device region.

49. The semiconductor device structure in accordance with claim **9** wherein said outermost doped region comprises a field shaping region spaced from said device region and spaced from said region of second conductivity.

50. The semiconductor device structure in accordance with claim **9** wherein said region of second conductivity type has a lower doping concentration than said device region.

51. The method in accordance with claim **17** wherein said outermost doped region comprises said device region.

52. The method in accordance with claim **17** wherein said outermost doped region comprises a field shaping region spaced from said device region and spaced from said region of second conductivity.

53. The method in accordance with claim **17** wherein said region of second conductivity type has a lower doping concentration than said device region.